

# Land Use Guide

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## Section One: The Vital Role of Aviation

America is a mobile society. Over the past forty years, aviation has contributed to this mobility as well as to the creation of new industries, communities, lifestyles, and recreational opportunities. Today, access to aviation is essential to the business traveler, an aid to the farmer, and an unparalleled convenience to the tourist.

In search of increased mobility, transportation systems have imposed a cost in terms of pollution, congestion, and social disruption. Aviation is no exception, and the far-reaching benefits of air transportation are sometimes diminished by the negative side effects of aircraft activity. In fact, in some areas of the United States, public reaction now threatens to constrain air transportation services, whose past growth is a clear statement of society's demand for available services. Fortunately, solutions are available to the problems associated with the growth of aviation. Technology is improving safety and reducing aircraft noise and emissions, and the federal government is committed to enforcing stringent standards. Careful zoning and planning can also mitigate or prevent many of the undesirable impacts caused by aviation.

### The Benefits of Aviation

Airports, aviation, and industries associated with aviation have a certain impact on the quality of life in Wisconsin and the economic development of communities throughout the state. Airports provide a gateway to Wisconsin for out-of-state tourists and the business traveler. The benefits of aviation are also felt in terms of increased agricultural yield and improved emergency and health services to isolated communities throughout the state.

The local airport is fast becoming the principle access route from a community to the nation. Communities of all sizes are realizing that being without air transportation is as detrimental to their economic development as

being bypassed by the railroads over a century ago, or being left off the highway map fifty years ago. Communities that are not readily accessible to the airways may suffer economic penalties that can affect every local citizen whether they fly their own aircraft, use the airlines, or never have occasion to fly.

Aviation directly supports Wisconsin's economy by:

- Generating over \$2.1 billion annually in economic activity in Wisconsin;
- Supporting over 41,000 jobs statewide; and,
- Producing \$775 million each year in personal income for state residents.

General aviation airports provide facilities for corporate travel, pilot training, recreational flyers and over 100 aviation businesses across the state.

Wisconsin's eight commercial service airports link residents and businesses to the rest of the nation and the world. These airports are key centers of economic activity, generating a large share of aviation's total impact on the state. Supporting over 21,000 jobs, these airports generate more than \$400 million in personal income for Wisconsin residents yearly.

Whether it is by commercial or general aviation, access to aviation plays a key role in the conduct of daily business throughout the state. Close proximity to airports increases opportunities for corporations and industries doing business in Wisconsin by permitting safe, efficient, and cost-effective travel for business passengers and freight.

Between 1990 and 1996 over 72% of new or expanded manufacturing businesses in the state were located within ten miles of a public-use airport capable of handling corporate jets. These manufacturers provided more than 28,000 jobs for Wisconsin residents. Of the 5,000 general aviation aircraft registered in Wisconsin, over 1,000 (20%) are registered to corporations doing business in the state.

Wisconsin also provides many other “quality of life” services. Communities across the state depend on these important services each day. Physicians and health support personnel utilize airports throughout the state. Many Wisconsin communities are now served by emergency and non-emergency fly-in medical personnel and diagnostic services. Emergency medical flights transport patients, organs for transplantation, and medical supplies quickly and safely.

Wisconsin’s law enforcement agencies rely on aviation as an important tool for keeping Wisconsin’s highways and communities safe.

Aerial spraying and other agricultural services assure that Wisconsin’s crops remain among the best in the world. Other essential services include environmental management,

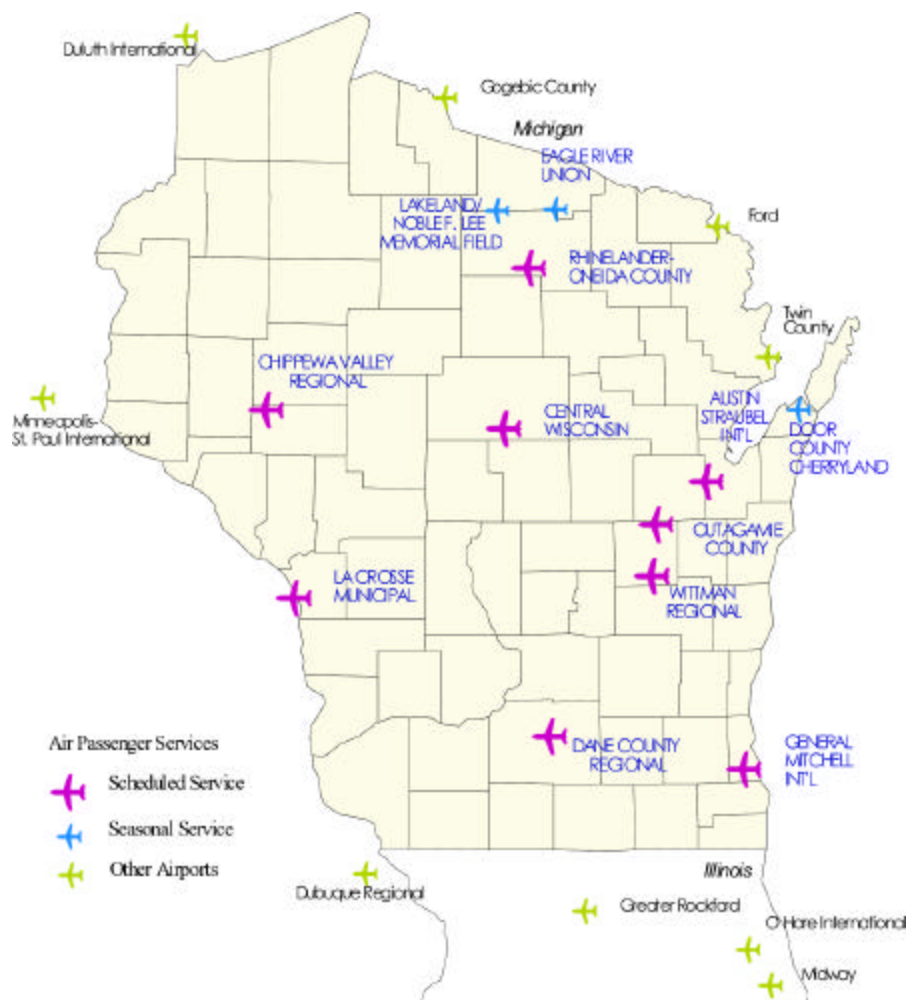
recreation, pilot training and aviation education.

## The Growth of Aviation

In the last decade, aviation has benefited from a strong domestic economy, new aviation technologies and services, and the passage of the General Aviation Revitalization Act. Aviation is expected to continue to grow.

Nationwide, domestic large commercial service enplanements are forecasted to increase 47% and air carrier operations are expected to grow 36% over the next 12 years. In Wisconsin, the total number of air carrier enplanements is projected to increase by approximately 85% over the next 20 years.

Figure 1: Airports with Commercial Passenger Service



The regional/commuter service industry is growing at a faster rate than the larger domestic counterparts. This is due to the rise of new markets using the new regional jets, and route efficiency by the larger commercial carriers.

The enactment of The General Aviation Revitalization Act of 1991 brought about product liability reform to the general aviation industry. As a result, there has been a positive turnaround in a previously fading industry and general aviation continues to be a dominant force in aviation. An increase in new jobs, production of general aviation aircraft, and research and development by general aviation companies has generated new growth and interest in the industry.

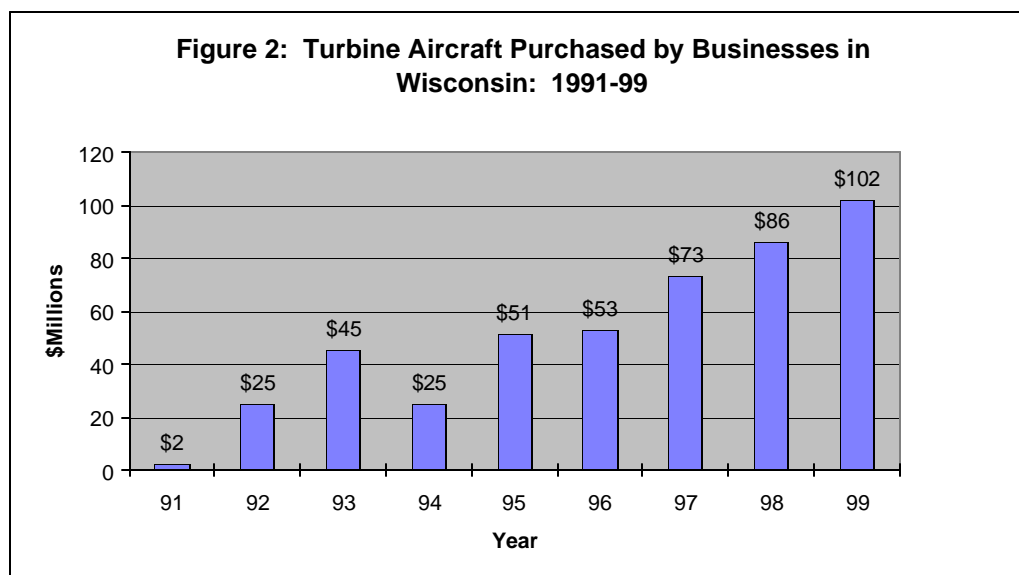
In 1998, there were over 240,000 active general aviation aircraft registered in the nation. Predictions show a 10% increase in the active fleet by 2011, and aircraft usage is expected to increase 27%. Most of the increase in aircraft usage occurs in turbojet aircraft, the fastest growing category of general aviation's active fleet and hours.

The need for airport development can be established within the general aviation industry by the past and projected strong growth of

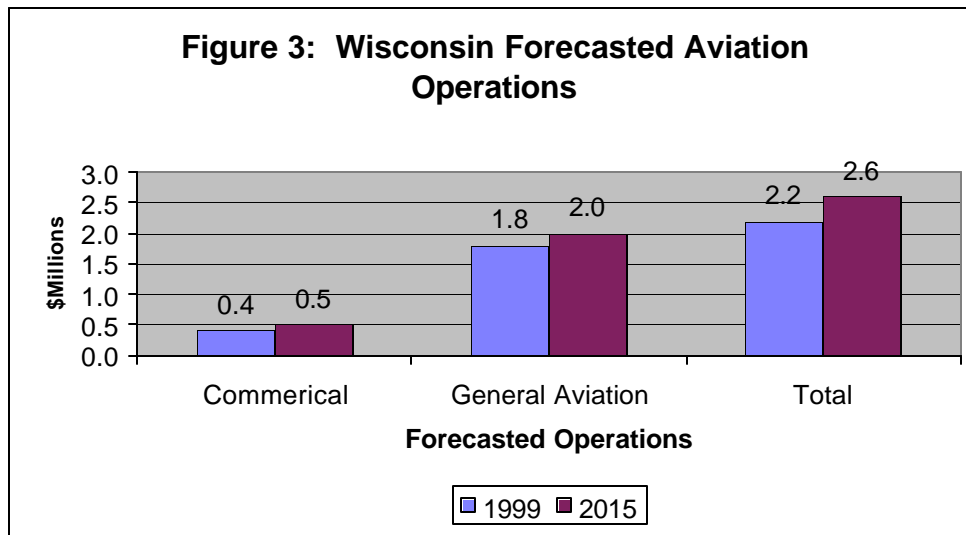
business aviation activity. During the 1950's and 1960's, most general aviation airport runways were designed for recreational flyers. The past two decades show how the role of the general aviation airport has changed. With corporate aircraft use increasing, general aviation airports are being transformed to serve both recreational and corporate aircraft. These airports have become an important economic producer for local, regional, and state economies. As a result, the general aviation airport owner is often faced with a need to extend the runway length, enlarge the apron tie-down areas, or provide additional hangars.

Fractional ownership programs are proving to be a successful avenue for businesses that do not generate enough flying to warrant a flight department. These programs allow companies to own a portion of an aircraft and receive management and pilot services. Forecasts indicate almost 7,000 new business jets will be delivered nationwide in the next ten years.

The growth of business aviation in Wisconsin reflects strong national and global growth trends. Over 200 turbine aircraft are now registered to 133 businesses in the state. Wisconsin businesses purchased over \$102 million in turbine aircraft in 1999 compared to just \$2 million in 1991.



Source: WisDOT, BOA



Source: FAA TAF

Forecasts of aircraft operations at Wisconsin's eleven tower controlled airports indicate that the state can expect to generally follow national trends for growth, but at a slower rate.

By 2015, statewide forecasts of operations total approximately 2.6 million, increasing 18%.

### Emerging Problems

Despite the effectiveness of today's aviation system and the far-reaching benefits it brings to the residents of Wisconsin, the optimum use of the system is under constant threat.

Incompatible land use issues have:

1. Made it difficult for existing airports to gain approval for needed expansion;
2. Seriously delayed new airport development; and
3. In some areas have resulted in legal actions to reduce and even eliminate aircraft operations. Incompatible land use is an important concern, but it need not compromise the growth of the aviation system if the future of the system is carefully planned.

Ironically, at a time when aviation activities are expanding at all levels, many airports are faced with the threat of closure. Airport land is frequently choice property for development. The preservation of airport lands, even when publicly owned, can be difficult, especially when incompatible land uses and

encroachments into the airspace have already been permitted in the immediate vicinity. In the case of private airports, the problem is compounded by heavy property tax burdens on the airport owner, which at any time could precipitate a conversion of airport land to more profitable uses. Once an airport in a populated area is closed, it is extremely difficult to find another equally accessible location.

Since 1985, twenty-one Wisconsin airports that were open to the public have been closed or are completely gone. At this time, the state does not have any legislative or administrative solutions to keep small, privately owned airports open to the public. The Department of Transportation's Bureau of Aeronautics provides technical assistance and guidance to these airports in the areas of airport operations and management.

Airports will continue to be an important component of a community, and they need to be protected through legislation and through the regulation of surrounding land uses. The impacts of aircraft noise and land use incompatibility are probably the most serious problems facing our airports. Solutions to those problems must be considered part of the community planning and development process.

To address the issues of aircraft noise and land use compatibility, federal legislation and

regulation over the past three decades has focused on:

1. Providing assistance to airport operators to prepare and carry out noise compatibility programs.
2. Providing funding for noise compatibility planning and projects.
3. Requiring airport operators to ensure that actions are taken to establish and maintain compatible land uses around airports.
4. Establishing a commitment to fully consider effects (including noise) of a proposed action such as a new runway or major runway extension.
5. Establishing mitigation measures, which minimize impacts to water, wetlands, and endangered species and protect the historical and cultural environment.

If an airport project receives federal aid, the airport owner is responsible for operating and maintaining the airport to specific standards contained in grant agreements. One of the assurances is compatible land use. This assurance obligates the airport owner to take appropriate action, including adoption of reasonable zoning laws, to restrict the use of land bordering or in the direct vicinity of the airport to activities and purposes harmonious with normal airport operations.

<http://www.faa.gov/arp/app600/5054a/landuse.htm>

The State of Wisconsin is interested in assisting local governments in meeting federal requirements of this type. The state also has an interest of its own in promoting and encouraging compatible land uses. The planned use of community land protects the investment of federal, state and local revenues in airport capital improvement and development projects.

Figure 4: Fond du Lac Airport, 1957



Figure 5: Fond du Lac Airport, 2000



## Section Two: Airports and Land Use

The noise and land use problems associated with today's airports have emerged over a long period of time. The changes in urban living patterns and transportation preferences over the past decades have brought these problems to a critical point. Aviation will continue to play an essential and increasingly important role in our transportation system—a role that each community should ensure by finding solutions to the problems associated with incompatible land use and aircraft noise. A timely resolution to these conflicts is a high priority for airport owners, local planners, and citizens throughout the state. A reflection on how they developed over the years may provide some insight into their solution and prevention.

### Origin of Land Use Conflicts

When first built, most airports were located away from developed areas where a flat piece

of land provided a suitable landing field. In some locations the landing field developed into the current facility while other communities planned the location of their airports based on the best available location for aircraft operations. No matter how the airport site was chosen, there was one common denominator; each site was usually surrounded by agricultural or undeveloped land. However, this desirable and compatible environment did not last.

Suburban growth, increased air traffic, and larger and faster aircraft combined in a short period to create a land use conflict where one had not previously existed. Even at sites that were originally criticized for having been constructed too far from the city, residential suburbs, industry, office and commercial business growth developed on what had been the agricultural or undeveloped land around the airport. Proper land use planning in the vicinity of airports requires a basic understanding of compatible and incompatible land uses.

Figure 6: Winnebago County (Oshkosh), 1943

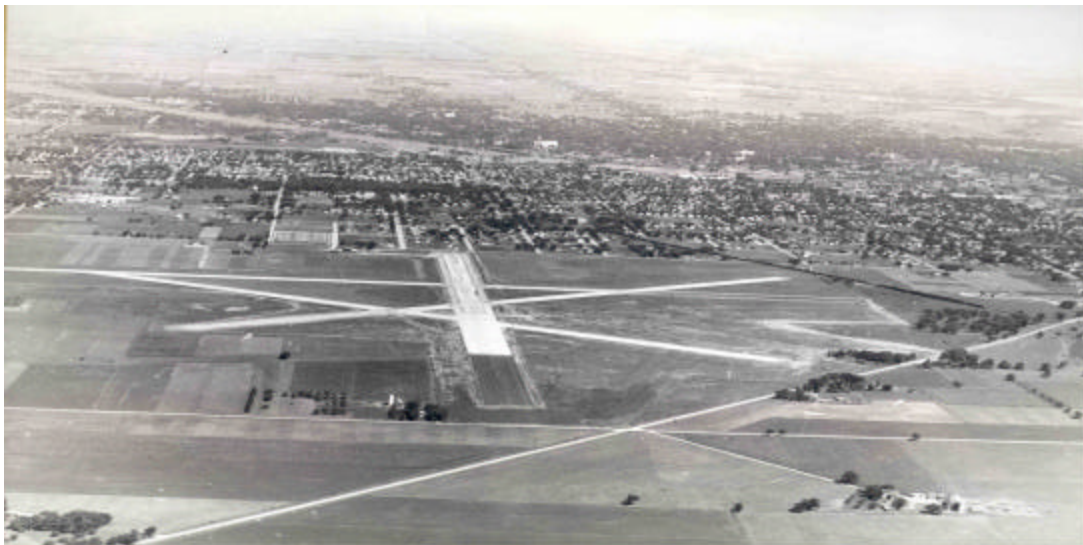


Figure 7: Winnebago County, 1997



### **Compatible Land Uses**

The types of airport compatible land uses depend on the location and size of the airport, as well as the type and volume of aircraft using the facility. Most commercial industrial uses, especially those associated with the airport, are good neighbors. Land uses where the airport creates the demand, such as motels, restaurants, warehouses, shipping agencies, aircraft related industries, as well as industries that benefit from access to an airport, are compatible land uses. At airport locations where there is not now a demand for these uses near the airport, communities may find it desirable to promote the use of this land for commercial or industrial use through a program of aids and incentives. Buildings and structures must not obstruct the aerial approaches to the airport, interfere with aircraft radio communications, or affect a pilot's vision due to glare or bright lights. Motels, restaurants and office buildings should also be soundproofed to make them more

comfortable and attractive to clientele and employees.

Other uses compatible with airports are large parks, conservatory areas and other open spaces. These land uses are created for public purposes and are opportunities for local government bodies to provide a compatible land use. Forestry services, landscape services, game preserves and some extractive industries such as mining and excavation are also land uses considered compatible with airports.

Agriculture is another land use that is compatible with airport operations. While some types of animal farming are sensitive to aircraft noise, most agricultural uses are not adversely affected by airport operations. Agricultural land also allows the owner of property near the airport to make an efficient use of the land while benefiting the community in terms of airport protection. Methods for preserving agricultural uses are discussed in Section Four.

| Table 1: Examples of Compatible Land Uses |                     |                                |
|---|---------------------|--------------------------------|
| Airport Related Uses                      |                     | Open Uses Involving Few People |
| Air freight terminals                     | Parking facilities  | Rivers, lakes and streams      |
| Trucking terminals                        | Car rental agencies | Unpopulated lands              |
| Taxi and bus terminals                    | Gas Stations        | Game preserves                 |
| Air cargo forwarders                      | Restaurants*        | Forests                        |
| Wholesale distribution centers            | Motels and hotels*  | Sod farming                    |
| Aircraft and parts manufacturing          | Night clubs*        | Truck farming                  |
| Aircraft repair shops                     | Convention Centers* | Landscape nurseries            |
| Aviation schools                          | Office buildings*   | Riding academies               |
| Airline schools                           | Banking services*   | Picnic areas                   |
| Aerial survey companies                   | Shopping Centers*   | Botanical gardens              |
| Aviation research and testing             |                     | Arboretum                      |
| Auto storage areas                        |                     | Mining and Excavation          |

\*May require soundproofing

## Incompatible Land Uses

Incompatible airport land uses include residential development, schools, community centers, libraries, hospitals, religious service buildings, and tall structures.

Residential housing is the most prevalent urban land use, and also the use most incompatible with aircraft operations. As residential development fills the vacant or former agricultural land between the urban settlement and the airport, the possibility of the residential development restricting the airport's potential increases. Residential growth restricts the airport by acquiring the land needed for expansion and by removing the buffer between the airport and residential neighborhoods. This buffer is important because it diminishes the impact of aircraft noise and lessens the possibility of an airplane accident in the residential neighborhood. As residential uses expand into this area around the airport, homeowners inevitably express concerns regarding safety and noise.

Wisconsin experienced a strong population growth during the 1990's, gaining almost 400,000 new residents. Metropolitan counties showed the most rapid growth. During a period of strong or rapid growth, residential uses have often developed too close to an airport. However, with careful planning there is no reason for the continued encroachment on the

airport by this type of incompatible land use. Residential neighborhoods, schools, churches and other similar land uses are the most susceptible to the side effects of aircraft operations. It is neither in the interest of the homeowner nor the community to locate these uses where they will be subject to the greatest impact of aircraft takeoffs and landings. It is clearly in the public interest that action should be taken to prevent this land use conflict.

Other examples of incompatible land uses around airports include wetland mitigation, retention ponds, and land fills. These may appear to be good land uses around an airport but are restricted or could possibly be associated with wildlife hazards. Caution should also be exercised with wildlife preserves located near airports due to the possible wildlife hazards associated with them.

The sound made by aircraft is a primary consideration in the determination of compatible land uses. Technical improvements in aircraft engines, flight paths that detour around populated areas, and changes in landing and takeoff procedures have continued to reduce the impact of aircraft noise. Aircraft will always create a level of noise that will make some land uses in the proximity of the airport incompatible. A more complete understanding of noise should help explain its consideration in the determination of compatible land uses.

Figure 8: Lawrence J. Timmerman Field



## Aircraft Noise

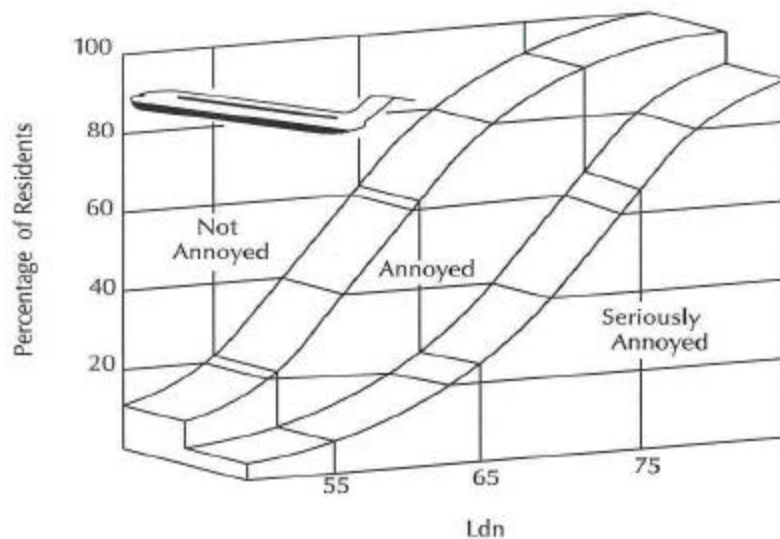
The introduction of jet engine aircraft, first in military use, then in commercial use, and most recently in general aviation, made the impact of aircraft noise more evident for several reasons. First, jet engines produce a sound, commonly referred to as “jet whine”, to which people are more sensitive than they are to the sound made by piston engines. Secondly, jet aircraft operations require larger areas of airspace, thus spreading the sound they make over an equally greater area of land. Third, the

convenience of jet travel and growth of the airline industry has led to larger jets and more frequent flights, both of which intensify the impact of aircraft noise.

Noise, very simply, is unwanted sound. What is not so simple is discovering the intensity of sound that becomes noise to most individuals. Extensive research has determined the levels of sound that disrupt human activities. Sound that disrupts activity is usually considered to be offensive and therefore, noise.

Figure 9: Noise Levels

| DNL           | Noise Exposure Class | HUD Noise Assessment Guidelines | Suggested Noise Controls  |
|---------------|----------------------|---------------------------------|---|
| 0 to 55       | Minimal Exposure     | Clearly Acceptable              | Normally requires no special consideration                                  |
| 55 to 65      | Moderate Exposure    | Normally Acceptable             | Land use controls should be considered                                      |
| 65 to 75      | Significant Exposure | Normally Unacceptable           | Noise easements, land use, and other compatibility controls recommended     |
| 75 and higher | Severe Exposure      | Clearly Unacceptable            | Containment within airport boundary or use of positive controls recommended |



Annoyance Caused By Aircraft Noise In Residential Areas

The sound intensity of an aircraft is only a portion of the measure of annoyance. A single jet takeoff might be noticed and soon forgotten. However, the repetition of the sound throughout the day, or during a limited period, would intensify the impact and increase the annoyance. Where the surrounding sound level, as in a shopping center, is relatively high, individuals are not as likely to be disturbed by the aircraft noise. Similarly, when the surrounding sound level is minimal, such as in a residential neighborhood at night, one jet aircraft operation might be enough to create a serious annoyance.

Various sound measurement methods have been developed over the years, but the currently accepted method is the average day-night sound level. This method of rating aircraft noise is explained in detail in Appendix A. The average day-night sound level (DNL) is the 24-hour average sound level in decibels, with the period between 10:00 p.m. and 7:00 a.m. receiving an additional decibel add-on factor. The table above indicates the anticipated effects of noise on people for the various average day-night levels of sound.

### The Airport - A Community Facility

Airports are important to the communities they serve and must be planned together with

adjacent land uses. In many cases, substantial amounts of public funds have been invested in the airport. Like schools, parks, highways, and other community facilities, once the facility has been constructed, it is difficult to gain support or find money for redoing the project, even if relocation becomes highly desirable. In the case of the airports, lack of appropriate sights in developed areas makes relocation even less likely. Consequently, in most Wisconsin communities, the present location of the airport will be the one that serves the community in the future.

The idea of promoting land uses that are compatible with public facilities is not a new idea. Residential neighborhoods have been planned around schools and parks to reduce the volume and speed of traffic. Noisy industrial and commercial uses are usually separated from residential housing. Schools are often located adjacent to public parks so the park can serve a dual purpose. These compatible land uses seldom take place accidentally. Compatible land use is generally promoted by the governing body of the community through various official actions.

By taking official action to promote land uses compatible with public facilities, the governing body is attempting to make the best use of the community resources in the interest of the

general welfare. Community resources include land and money. Public facilities that cannot be used to their highest potential because they have become outmoded before their time, are unable to expand on-site to meet demand, or are restricted in their use represent a waste of community resources.

Airports are community facilities and, like schools, parks and highways, represent a public benefit. The promotion of compatible land use in the vicinity of airports should, therefore, be an objective of the governing bodies of the community. The actions governing bodies might take to promote compatible land uses around the local airport are subject of the next section.

## Section Three: Planning for Compatible Land Use

Many of the community problems associated with incompatible land use around airports could have been prevented if the changes that took place in urban land use during the post World War II era could have been better anticipated. Economic growth and technological change were so rapid that most communities could only provide the general needs. The inevitable conflict between airports and residential development is but one of the results.

Today, it is a challenge to maintain the facilities built to serve a growing population while at the same time provide for future expansion. Planning now for growth and change is the best way to provide for the future and make the most efficient use of existing airports. Planning has developed into a more formalized structure with methodologies that can help community leaders foresee the directions their communities might take. At the same time, state legislatures have provided local government with the planning tools to allow them to direct their growth in an orderly manner.

### Airport Planning

Planning ahead for airports is performed at several levels because airports are complimentary of each other. What happens at one airport may affect other airports within the system. As a result, coordination of national, state, and local development plans may be

required. The following is a summary of the different levels of system planning.

### System Planning

#### National System Planning

The National Plan of Integrated Airports Systems (NPIAS) is a 10-year national system plan, which lists the public use airports and their developments that are considered to be in the national interest and eligible for federal financial assistance for airport planning and development.

The federal government enacted the Airport and Airway Development Act of 1970 to assist state and local authorities in the planning and development of airports of national interest. The general intent of the Act was that each state should have a plan for the systematic development of these airports, with the federal government participating financially in the preparation of the plan and the facility development. State transportation or aviation planning agencies perform this planning with regional and local input.

#### State System Planning

The *Wisconsin State Airport System Plan 2020* is the state's airport system plan (SASP). The primary purpose of the plan is to provide for the orderly and timely development of a system of airports adequate to meet the future aviation needs of the state over a 20-year planning period. The plan defines the State Airport System and establishes the current and future role of each airport in the system.

| <b>Table 2: Airport Classification</b> |  |   |
|--|--|---|
| <b>Classification</b>                  | <b>Function</b>  | <b>Normal Critical Aircraft Type</b>                                    |
| Air Carrier/Cargo                      | Serve all aircraft up to and including wide body jets and large military transports. |   |
| Transport/Corporate                    | Serves large aircraft up to 60,000 lbs.  | Aircraft range from corporate aircraft to commuter airlines.            |
| General Utility                        | Serve all small single or twin engine piston or turboprop aircraft                   | Aircraft used for business, charter flying and personal reasons.        |
| Basic Utility - B                      | Accommodates small single or smaller twin engine piston aircraft                     | Aircraft typically used for personal, business, and charter flying.     |
| Basic Utility - A                      | Accommodate small single engine piston aircraft.                                     | Aircraft typically used for personal, training, or agricultural flying. |

Note: This airport classification scheme expands upon the FAA's traditional classification system for defining the function of an airport.

The SASP serves a number of additional purposes. The plan:

- Forecasts the level of public investment required to upgrade, preserve and enhance the system;
- Is used by WisDOT's Bureau of Aeronautics to pre-qualify airport improvement projects submitted by airport owners for funding consideration;
- Provides a long-range perspective for public-sector investment decisions; and
- Provides data on Wisconsin airports to the FAA for possible inclusion in the NPIAS, which, if accepted, would qualify them to be eligible for federal development assistance.

### **Regional System Planning**

Regional metropolitan airport system plans identify airport needs for large regional metropolitan areas and is prepared by regional/metropolitan planning agencies. Needs are stated generally and incorporated into state system plans. The *Regional Airport System Plan for Southeastern Wisconsin: 2010 Findings and Recommendations* are consistent with the SASP. This is the only regional airport system plan in Wisconsin, and addresses the

unique aviation needs of the greater Milwaukee metropolitan area.

### **Comprehensive Planning**

A comprehensive plan is a long-range plan for community development that identifies the physical, economic, social, political, aesthetic, and other related factors of the community. There are several elements of a comprehensive plan that will be discussed in this section

Regional and community comprehensive planning begins at the local level. The preparation and adoption process of a comprehensive plan is crucial because it helps to ensure land use compatibility in and around airports and should be the first step in developing policies. This process can also provide the community with an understanding of any land use conflicts and solutions.

It is here also that the airport is carefully thought about not only in terms of its impact on transportation, but also in terms of its effect on the local economy, land use, and environment. Especially important, where pertinent, is access to the airport by road, rail, and mass transit.

Within the land use element of the comprehensive plan, the future plan should show the land needed for airport purposes and designated uses for surrounding land that are

compatible with the airport. The general location and extent of designated uses should be based on a forecast of demand for various types of development and a consideration of the likely characteristics of the development.

Various land use regulations and policies should be adopted to promote the land use plan identified in this planning process. Communities with comprehensive plans achieve success in land uses compatible with the local airport and also provide a legal basis for airport land uses and community consensus in support of the airport's operation.

### **Comprehensive Planning Legislation**

In 1999, Wisconsin Act 9 was adopted and brought about a comprehensive update to Wisconsin's planning laws. This planning legislation provides the framework for developing comprehensive plans. Wis. Stat. 66.1001 states that a comprehensive plan must contain at least the following nine elements:

- issues and opportunities;
- housing;
- transportation;
- utilities and community facilities;
- agricultural, natural and cultural resources;
- economic development;
- intergovernmental cooperation;
- land use; and
- implementation.

"Old law" plans will remain viable until January 1, 2010. After that date, according to the new provisions, all community land use decisions must be based on an adopted comprehensive plan that is derived from the new statutes. The legislation states that a comprehensive plan should be updated no less than every ten years. Future updates should refer to the new requirements. For some communities, these requirements will be a new way of conducting land use decision-making.

This legislation provides local governments with a structure for developing a

comprehensive plan and using it as a foundation for land use decisions. Comprehensive plans are not mandated by this legislation. Rather, the legislation encourages communities to take an all-inclusive approach to gather the future needs and desires of its' residents. More detailed information can be found on the Wisconsin Department of Administration website at <http://www.doa.state.wi.us/olis>. The Department of Transportation has developed a publication for the transportation element of the comprehensive plan entitled *Transportation Planning Resource Guide*. It can be downloaded from the DOT website <http://www.dot.state.wi.us/>.

### **Planning Grants**

In addition to the new comprehensive planning legislation, the state has funding opportunities available to assist communities to help finance the cost of developing a comprehensive plan. This funding is available through the Department of Administration, Office of Land Information Services <http://www.doa.state.wi.us/olis>.

### **Airport Master Planning**

Both local land use planners and airport planners use the airport master planning process to evaluate new development within the airport environs. It should be incorporated into local comprehensive land use plans.

Integration of airport master plans and comprehensive land use plans start during the development of the master plan. The airport master plan includes an analysis of the specific improvements necessary to meet the standards of an airport providing the proper level of service for the forecasted demand. A good master planning process will identify the impact of airport operations on land use in the vicinity and recommend actions to alleviate negative impacts. The master plan will also show the areas for which land acquisitions, fee simple or easements should be obtained. This is very useful input into the comprehensive

planning process and subsequent land use policies.

The technical nature of facility design requires that professionals experienced in airport design do much of the master plan. Design engineers are usually hired on a consulting basis, or an engineer/planning consultant is engaged to do the complete plan. These individuals should work closely with local officials and planners to ensure the future compatibility of the airport and other community land uses. Airport master planning is recommended for larger airports. Federal aid is also available for airport master planning. The Wisconsin Department of Transportation, Bureau of Aeronautics should be contacted for information about airport master planning and planning grants.

### The Airport Layout Plan

The existing and proposed developments in the airport master plan are graphically presented to scale in the Airport Layout Plan (ALP). It will show existing and proposed airport facilities, their location on the airport, and clearance and dimensional information required to show conformance with standards. The development of the ALP will establish the configuration of runways, taxiways, and aprons and will set aside areas for the establishment of terminal facilities. Additionally, runway approach zones should be incorporated on the ALP. The layout plan will show the ultimate amount of property needed for existing and future airport facilities. It is the one portion of the Airport Master Plan that must be reviewed and approved by the Federal Aviation Administration (FAA). Section Five lists all system plan airports that have developed or are revising ALP's.

### Analyzing the Airport's Impact on Land Use.

The impact of the airport on community land use is an important consideration in all planning processes. This process of evaluation should take place in preparing the land use elements of community comprehensive plans and airport master plans.

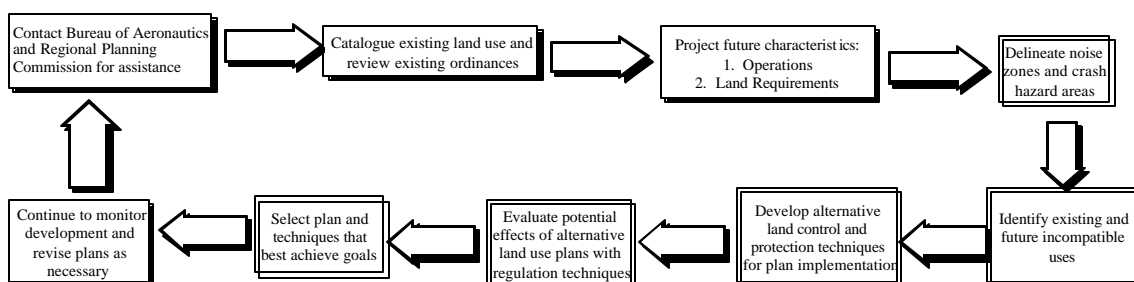
All Wisconsin airport owners should consider appropriate land use zoning controls prior to the development of land near the airport. Satisfactory safeguards should be incorporated early in order to prevent incompatible land uses from occurring along with the ensuing noise complaints. Adequate land use controls will also provide space for future airport development and expansion.

### Federal Assistance – FAR Part 150 Program

Federal assistance for airport noise compatibility planning is available through the Federal Aviation Regulation Part 150 Program, Airport Noise Compatibility Planning. In general, if an airport has less than 90,000 annual operations or less than 700 jet operations, the collective noise levels of more than 65db DNL normally remain within the airport's property line. If this is the case, smaller airports often find that conducting a Part 150 study does not provide any significant benefit to the community.

The FAA has revised the original policy on approval and funding measures. The revision discourages new home construction in specific noise contours around airports. The FAA will

LAND USE COMPATIBILITY PLANNING ACTIONS  
FIGURE 10



approve under its Part 150 program only “remedial” noise mitigation measures for existing non-compatible development around airports, and only “preventive” noise mitigation measures (comprehensive planning, zoning, subdivision regulations, building codes, real estate disclosure, and acquisition of vacant land) in areas of potential new non-compatible development. The policy only applies to new home construction within the 65db DNL contours around airports, not to homes already built in these areas. More detailed information can be obtained by referring to the FAA’s Federal Aviation Regulation Part 150 Program <http://www.faa.gov/arp/app600/5054a/landuse>.

### **Integrated Planning**

Airport System Planning, regional and community comprehensive planning, and airport master planning may proceed independently. However, the value of each is increased when one plan provides input into

another. This can be seen in the process of developing compatible land use plans.

Airport classifications found in the SASP define the needed airport facilities based on community characteristics. These classifications take into account existing conditions that include aviation activity, aircraft types, and planned near-term improvements as contained in airport master plans and or airport layout plans. This in turn impacts the land use around the airport and should be an important consideration in preparing the land use element of regional and community comprehensive plans. The process continues with the community air transportation needs providing input to the state system plan.

System planning is initiated by the State of Wisconsin, but the airport owner must initiate comprehensive planning. Implementation of the plans is discussed in the following section.

## Section Four: Implementing Land Use Plans

Generally, land use plans provide the policy foundation for using different tools and strategies available to tackle community growth and change. Implementing land use plans effectively can be accomplished in a variety of ways to achieve community objectives. Some of these tools are discussed in this Section.

### Land Acquisition

Land acquisition is an important part of implementing airport land use plans. Land used for runways, terminals, hangers, taxiway aprons and other airport associated uses should be owned in fee simple by the airport. *Fee simple is an interest in property under which the owner is entitled to unrestricted powers to dispose of the property, which can be left by will or inherited.* It is a commonly used term for full ownership of property. This ensures the airport owner maximum control of the use of the land most critical to the airport's operation. Financial aid is available to purchase land needed for these facilities.

The Wisconsin Department of Transportation, Bureau of Aeronautics can provide information concerning the extent of runway approach and land acquisition eligible for financial aid for a particular airport.

Property can be acquired by purchase or gift. The Wisconsin Statutes authorize the use of eminent domain (also known as condemnation) by municipalities and counties to purchase property needed for airport purposes.

In addition to land specifically required for airport facilities, fee simple ownership is preferred in runway protection zones (RPZ) and primary approach surfaces. The RPZ's function is to enhance the protection of people and property on the ground (AC150/5300-13, chg. 4, paragraph 212)  
<http://www.faa.gov/arp/150acs.htm>

Community planning helps protect people and property by locating only airport compatible uses in the approach areas. Potential compatible public domain uses are conservancy areas, open spaces, flood plains, transportation routes and scenic easements. Public expenditures for these facilities would also benefit the community by providing a compatible airport neighbor and preventing urban encroachment. Depending on the classification of the airport, the terrain, and the distance from the end of the runway, compatible uses might also include agricultural operations and parks, provided they are designed to not attract large groups of people or wildlife and do not interfere with navigational aids. As discussed earlier, incompatible land uses include residential development, schools, community centers, libraries, hospitals, religious service buildings, and tall structures.

### Easements

An **easement** is a right of another party to part of the total benefits of the ownership of real property. Easements may be used as an effective and permanent form of land use control. Easements are purchased and permanent, with the title held by the purchaser until sold or released. They work equally well inside or outside zoning jurisdictions. Short of purchasing the property in fee simple, easements permit the purchaser the use and enjoyment of another's property and property rights for the special purposes stated in the easement agreement. Easements relinquishing the development rights to property require that the land be kept in its natural state, or permit farm lands to continue in agricultural use but prohibit further development of the land. This arrangement can be beneficial: the property remains on the community tax rolls; and the farmer does not lose productive farmland.

An **avigation easement** is the right granted by, or taken from, the owner of land near an airport for the use of the airspace above a specific height for the flight of aircraft. This easement prohibits the owner from using the land for structures, trees, signs, stacks, antenna, etc.,

higher than the altitude specified in the easement. It also addresses dust, noise and vibrations from the aircraft, and restricts lights, radio waves and electromagnetic emissions. The degrees of such restriction will vary in accordance with the airspace necessary for the safe use of an airfield's runways.

Easements of this type are often acquired for both developed and undeveloped properties.

A **clear zone easement** is a property interest in airspace over a particular portion of ground, providing only for protection from obstruction by preventing the erection or growth of all objects above the acquired height limit and the right of entry to remove, mark or light any structures or growth above the acquired surface. A clear zone easement always has an aviation easement to go along with it.

Where easements and fee simple purchases cannot be obtained by negotiation they may be acquired through condemnation.

### **Advanced Property Acquisition**

Advanced property acquisition may at first appear to be an excessive expense. However, it is good planning to acquire property prior to development rather than after it is developed. Before airport expansion is imminent, the value of the land adjacent to the airport may not be greatly inflated. Public acquisition before land costs increase represents a potential savings in future purchase costs which should offset the long-term interest costs of the purchase. Current land purchases may be reimbursable at the time they are used for future approved airport projects. Consult with the Wisconsin Department of Transportation, Bureau of Aeronautics for details about reimbursable land acquisition.

Additionally, the State of Wisconsin has authorized low interest loans for airports to purchase needed land. The land must be part of a planned airport improvement project, or land that is essential to future airport development or to the safety of aircraft using the airport. The loan, which is administrated by the Department

of Transportation, Bureau of Aeronautics, can be for up to 80% of the estimated land acquisition costs for a period of no more than 5 years. An annual interest rate of 4% is charged.

The intent of advanced property acquisition is to insure that its use will be compatible with future airport operations. Once in public ownership the airport can lease the land for compatible uses such as agriculture. Land needed only for airport protection, not for future expansion, can be resold to the public with deed restrictions that would prohibit incompatible land uses. Foresight on the part of community leaders is required for this type of action. Hindsight by airport owners now faced with land use conflicts has proven the desirability of advanced acquisition.

### **Land Use Regulation**

Land use regulations are not intended to be alternatives to property acquisition. Where property rights and land are required for airport purposes they must be obtained by fee purchase or by easement acquisition. Land use regulation is a power allowed by federal and state laws to promote and protect the public health, safety, and general welfare. Community plans are partially implemented through the enforcement of land use regulations. The regulations applicable to airport planning include zoning, plat and subdivision review, and building codes.

### **Land Use Zoning**

Zoning is the most commonly used form of land use control. Zoning designates those areas of the community most suitable for particular land uses. The desired distribution of land uses in the comprehensive plan becomes the basis for the zoning scheme.

Land use zones, called districts, are shown on a map and are a required part of a zoning ordinance. The uses permitted in each district must also be stated in the ordinance. Some permitted uses may be conditional, requiring a special permit. Airport land is usually designated as a conditional use in an

agricultural or industrial zone. Airports are not in a zone of their own since they are not a use that reoccurs throughout the community. Instead, airports are permitted uses or conditional use in zones where they would be compatible with the predominant use.

### **Wisconsin Law 114.136**

Wisconsin Law 114.136

<http://www.legis.state.wi.us/> was established to give local governments the authority to adopt ordinances to protect the critical approach zones to their airport. This state law permits these public airport owners to establish extraterritorial land use controls up to a distance of three miles from the boundary of the airport. These land use controls supersede all other applicable zoning limits by other municipalities that might apply. Some of Wisconsin's busiest airports have adopted land use controls based on this statute, limiting the further development of incompatible land uses. Section 5 discusses the experiences of some of these airports.

A zoning plan can be adopted without a community comprehensive plan, but as discussed previously, the comprehensive plan strengthens the zoning plan's validity. Zoning procedures require that all land in the community be zoned. Because of this requirement the zoning plan is said to be comprehensive. However, the comprehensive zoning plan should not be confused with the community comprehensive land-use plan.

### **Airport Noise Overlay Zones**

Airport Noise Overlay Zones (ANOV) or districts, are an important consideration for possibly regulating land use around an airport. The ANOV is a district that is incorporated into a local zoning ordinance. The benefit of adopting airport overlay zoning is that it promotes compatible land uses for specific distances around airports. The boundaries of an airport noise overlay zone are usually based on the development of noise exposure contours. From this, restrictions on permitted land uses and limits on building (structure) heights are

developed. See Section 5 for some examples of airports using airport noise overlay zones.

### **Zoning Provisions Affecting Airports**

In an effort to accommodate the public interests in aviation services and a safe and healthy environment for the lands adjacent to airports, the Wisconsin Legislature passed 1985 Wisconsin Act 136. The three key provisions from this Act have since been incorporated in the Wisconsin Statutes (Chapter 59 (counties), Chapter 60 (towns), and Chapter 62 (cities). The primary purpose of this law was to supplement existing zoning procedures and land use criteria for areas adjacent to or in the immediate vicinity of a public airport.

The law contains three key provisions.

1. Each county with a development plan or each municipality with an official map must include on the plan or map the location of any publicly owned airport and areas affected by airport operation. This requirement is designed to provide additional formal notice of the existence of the airport. The effect is an enhanced awareness of airport affected areas that will lead to voluntary development and use of lands adjacent to the facility compatible with airport operations. This airport mapping provision may also prove useful in nuisance litigation. Mapping can be used to help establish that the property was already affected by the airport operations when the owner began using the property.
2. Second, the 1985 law also requires the zoning authority to notify the airport owner of any proposed zoning changes within the "airport affected area." "Airport affected area" is defined as the area in the vicinity of the airport that is significantly affected by airport operations and which is included in a written agreement between the airport and the local zoning authority.

However, if there is not written agreement, the statute defines the “airport affected area” as the area located within 3 miles of the boundaries of any airport. The notice to airport owners of proposed zoning changes assures that they have enough time to react to a proposed land use prior to any zoning change. This notice also provides airport owners with the information necessary to informally pursue alternatives or modifications of land use plans that would be compatible with airport operations.

3. Finally, if the other provisions fail, the law allows the airport owners to protest any proposed zoning changes in the airport affected area. Thereafter, the proposed zoning change requires a two-thirds vote of the members of county, town, village or city present and voting. This protest ability and extraordinary zoning change requirement assures that the airport owners concerns regarding land use adjacent to the airport will get full public review and that incompatible or inconsistent land uses with the airport will only occur when there is extraordinary local support for the proposed land use.

### **Limitations on Zoning**

While zoning is useful in implementing land use plans there are some limitations that restrict the use of zoning for airport protection.

One limitation is that land must be zoned for some economic use, unless it is public property for which the desired use is open space or conservancy. Private property owners must be permitted some economic use of their land. Since tax assessments are based on the highest and best use of land, pressure is placed on zoning officials to zone land for its highest and best use. The highest and best economic uses are not always the most compatible uses in terms of community development. Again, the best means to validate zoning land for other than the highest and best use is to prepare a

community comprehensive plan along with or prior to a zoning plan.

A reasonable demand should exist for the permitted use of zoned land. The demand does not have to exist at present but the capability of demonstrating that the demand will exist in the future is necessary. For example, an industrial park is a desired and compatible airport associated land use. Land adjacent to the airport may be zoned for industrial use if it can be shown that the potential exists for an industrial park to develop.

Another limitation on the use of zoning is the lack of retroactivity. Existing uses must be permitted to continue as long as the use is continuous and unchanged. Where the majority of land in the community is developed, it is extremely difficult to change the development patterns through zoning. Zoning is not a means to eliminate existing uses that may not conform to the desired plan. Land with existing uses may be re-zoned to a more desirable use but the existing use may continue as a nonconforming use.

Also, most zoning plans are only applicable in the jurisdiction of the government adopting them. County zoning ordinances generally apply to towns and unincorporated county areas. Towns in counties without zoning ordinances may adopt their own ordinances. Towns with ordinances adopted prior to the county ordinance may subsequently adopt the county ordinance. The towns using the county ordinance must ratify amendments to the county zoning ordinance. County ordinances do not apply to villages and cities within the county. Cities and villages may zone the land within their boundaries. In Wisconsin, the majority of zoning for uses compatible with the airport has been done separately by each jurisdiction with land in the airport area. This fragmented approach to zoning increases the difficulty of implementing an airport land use plan through zoning.

However, in 1986, the Brown County Board of Supervisors adopted the Austin Straubel Airport Zoning Ordinance. This ordinance

regulates the use of land within three miles from the boundary of the airport. The ordinance is based on Wis. Stat. 114.136. The Austin Straubel Zoning Ordinance is discussed in greater detail in Section Five.

Despite some limitations, zoning provides the most positive means to airport protection, next to property acquisition. Care must be taken in the drafting of zoning ordinances or amendments to insure that they are legally valid. Help in drafting zoning ordinances may be obtained from local planners, zoning administrators, legal counsel, and regional planning commissions and the Bureau of Aeronautics.

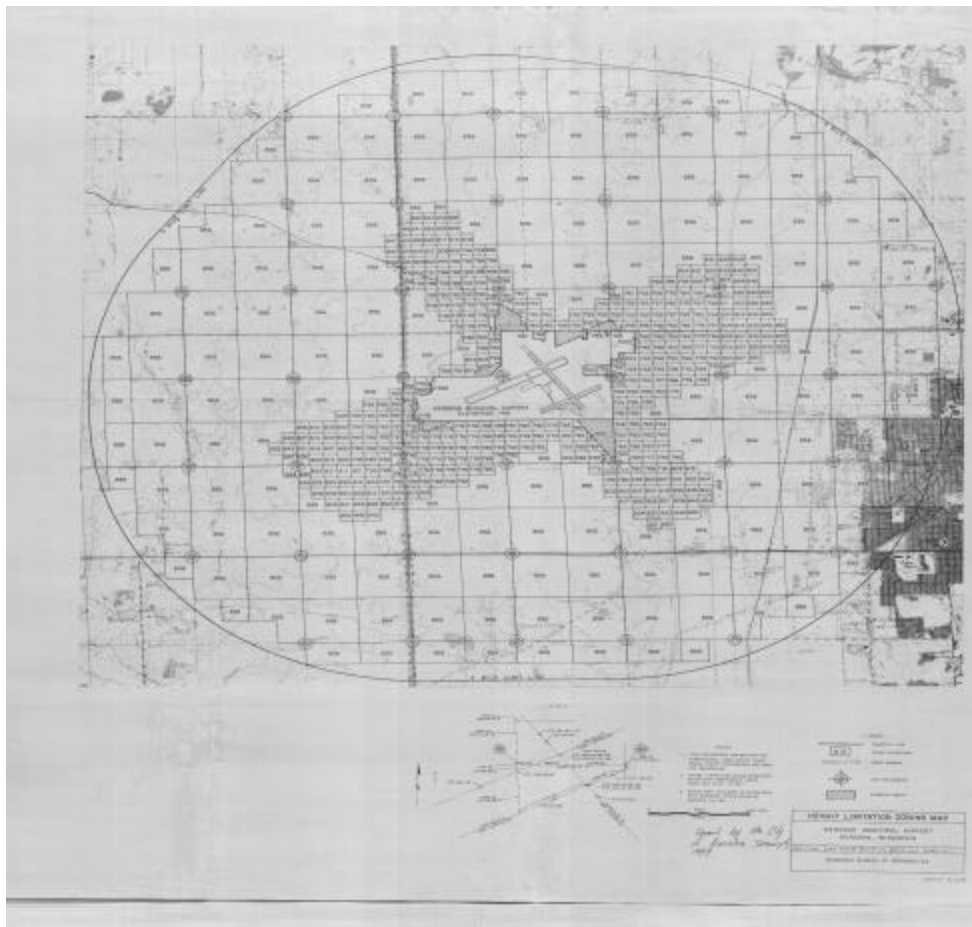
### **Airport Height Limitation Zoning**

To protect the investment of taxpayer dollars at Wisconsin's public-use airports, the state legislature has authorized municipal airport

owners to protect their airports (Wis. Stat. 114.136, Airport Approach Protection). This can be accomplished through an ordinance. An ordinance can protect an airport by restricting and determining the use, location, height, number of stories, and size of buildings within three miles of the airport. This ordinance is commonly referred to as the Height Limitation Zoning Ordinance or HLZO.

The HLZO protects the navigable airspace around an airport for traffic patterns and approaches to the runways. HLZO height restrictions can start at ground level, but generally vary from 50 to 150 feet above the ground. The intent of the HLZO is to prohibit the construction of structures that would interfere with aircraft operations. A map is adopted as part of the ordinance showing the allowed height in specific areas around the airport.

Figure 12: Height Limitation Zoning Map, Kenosha Regional Airport



**Extra-territorial** - An important point of the HLZO is that it is extra-territorial. An HLZO applies to ALL land shown on the HLZO map, even if the land lies within the boundaries of another municipality. In some areas the number of municipalities affected can be extensive. For example at the Dane County Regional Airport, even though Dane County administers the HLZO map, the area of the map involves nine other municipalities within the county.

**Variances** - Under some conditions, it is possible for the controlling municipality to grant a variance authorizing a proponent to build up into the airspace protected by the HLZO. However, those instances are few, should happen rarely, and then only when a structure will provide an exceptional benefit to the community that is worth the expenditure of an irreplaceable resource.

When considering requests for variances, zoning boards should do a cost-benefit analysis, and weigh what their community will gain in exchange for giving up valuable airspace. If the structure is going to be an obstruction hazard, or degrade any existing or future approaches it should not be considered. Typically, variances are considered for things that add to the community's infrastructure such as water towers, but should not be considered for projects that benefit only a privately owned company's bottom-line profit. As you consider requests for variances, the Bureau of Aeronautics can give you advice on whether or not you will want to approve the variance.

**The FAA's Role** - The FAA also plays a role as proponents ask you for permission to build tall structures around your airports. The bureau recommends you never consider a request for an HLZO variance, construction permit, or conditional use permit until the proponent can demonstrate that the FAA has completed an aeronautical study of the project and issued a determination of "No Hazard to Air Navigation".

Proponents can ask the FAA to perform an aeronautical study by submitting to the FAA a Form 7460-1, *Notice of Proposed Construction or Alteration*. There is no charge for the study, but it can take as long as 60 days to complete.

**The FAA is not an approving authority** for structures off airport property. An extremely important point to understand about the FAA's determination is that it is advisory only, and is only one of several things to consider when deciding whether to approve a tall structure. An FAA determination of No Hazard is NOT approval for a proponent to build. The FAA does not give approval—they simply give an opinion of whether or not a proposal would be hazardous to air navigation. The Act that established the FAA in 1958 deliberately reserves approval for the local level.

More than 80 public-use airports in Wisconsin currently use an HLZO to help protect their airports. We strongly recommend and urge airport-owning communities without HLZOs to adopt them. The HLZO is an effective and valuable weapon to have in your arsenal for protecting the airspace around your airport. The Bureau of Aeronautics is available and ready to assist those communities who would like to draft, pass, and implement height limitation zoning ordinances for their airports. FAA also has Advisory Circular (AC) 150/5190-4A, "A Model Zoning Ordinance to Limit Height of Objects Around Airports" that may be referenced

<http://www.faa.gov/arp/150acs.htm>.

## **Wisconsin Administrative Code - TRANS 56**

For areas outside of those protected by a height limitation zoning ordinance, TRANS 56, Erection of High Structures, <http://www.legis.state.wi.us/rsb/code/trans/trans056.pdf>, gives the *Department of Transportation* permitting authority over some tall structures under the provisions of

state statute 114.135, Airport Protection, <http://www.legis.state.wi.us/>.

This authority applies only to structures of 150' above ground level or greater, and which would: 1) Extend to more than 500' above the lowest ground or water surface elevation within one statute mile of the tower's base, or 2) Extend above a height determined by the ratio of one foot vertical to 40 feet horizontal measured from the nearest boundary of the nearest public-use airport within the state.

### **Exclusive Zoning**

The imperfection in the cumulative nature of early zoning ordinances became apparent as towns, villages and cities grew. Cumulative zoning meant that a "higher use" was permitted in a "lower use" zone. Single-family residential use was normally the highest use and agriculture was the lowest use. Under this system residential development was permitted in the lower use districts such as industry and agriculture. As zoned urban areas grew, airports located in agricultural zones were subjected to residential development on abandoned farmland. Today, the majority of ordinances are exclusive zones, in which only the uses specified for the district are permitted.

Since airports are most frequently located in agricultural zones the use of exclusive agricultural zoning is beneficial to the interests of the airport. Zoning ordinances should be worded to permit only farm-associated residential use on large size lots in agricultural zones. This is a reasonable requirement for agricultural land and would not put a burden on the farm operator. Higher density development would require rezoning to residential use districts. At the time of the rezoning petition, the municipal or county governing body should consider the problems of permitting residential use in the vicinity of the airport.

Suburban growth and highest and best use tax assessment policies have created the demand

for rezoning agricultural land to permit residential use. As agricultural land closer to urban areas is rezoned, the assessed value of adjacent agricultural land rises. At the same time, the land becomes less desirable for farming. Unwilling to pay the increased tax, farmers may sell their land to be developed as residential subdivisions. As a result, the protection provided airports by agricultural zoning is lost.

### **Exclusive Agricultural Zoning**

Many counties in Wisconsin are attempting to preserve agricultural land through zoning. The rezoning process was changed after amending the community comprehensive plan to include the retention of prime agricultural land as a community objective. Under this process, agricultural land is classified according to its suitability for agricultural use. Rezoning petitions are then considered in terms of the desirability of retaining the land for agriculture compared to its potential for residential use. Only land that has a very low potential for agriculture and is also convenient to residential services and utilities would be assured of rezoning.

A change in the State Constitution opened the way for providing tax relief to farmers wanting to keep their farms in agricultural use. The assessed value of farmland and open space does not have to be uniform with the assessed value of any other property. There is no requirement that farmland close to residential development be assessed at a higher value than farm land elsewhere in the assessment district. Farmers aware that their tax burden will not increase due to urban encroachment might be less likely to abandon farming. Differential taxation, combined with the retention of prime agricultural zoned land is an effective means of protecting farmland, including farm land that provides a protective buffer to airports.

Exclusive agricultural zones and differential agricultural taxation are relatively new land use planning tools. Advice on these measures is available from the Wisconsin Department of Agriculture, Trade and Consumer Protection.

## Plat and Subdivision Review

The contribution of plat and subdivision review to insuring land use compatibility is not as effective as zoning but still provides some opportunities to promote land use compatibility around airports. The purpose of plat review is to regulate the subdivision of land to promote public health, safety and general welfare. Conceivably this would include preventing land uses that would conflict with existing uses. Current practice, however, is to consider zoning conformance sufficient authorization for use. Plat review is limited to insuring the proper subdivision and design engineering of land. This practice limits the use of plat review as a means of preventing uses deemed incompatible with an airport.

In most areas of Wisconsin, county planning agencies have plat review authority. By statute, county boards may consider the potential conflict between the platted use and existing or planned airports as a reason to deny plat approval. To substantiate the existence of a conflict, data defining noise impact areas and approach zones should be considered. The nature and source of this data is explained in Appendix B. Plat review authority may be used to require the identification of aircraft noise contours on the plat map. While this does not constitute a restriction on use it does provide

official notice that the property is subject to noise created by aircraft operations that might make certain uses of the property undesirable. Plat approval in these noise-affected areas might require notice of the noise susceptibility as part of the property deed, thereby providing notice both for the original purchasers and future owners of the property.

An example of effective plat and subdivision review involves the Dane County Regional Airport located in Madison. The airport has an agreement with the City of Madison regarding plat approval. The city notifies the airport when a developer submits a plat for approval within the airport-affected area. If it is felt that the plat is in an area that could be impacted adversely by the airport, the developer is required to agree to the placing of a Noise and Avigation Easement and Non-Suit Covenant (See Appendix C) on the entire property as a condition of plat approval. Thereafter, the Noise & Avigation Easement and Non-Suit Covenant run with the land and become a deed restriction appearing on title searches. Potential buyers are notified that there is a Noise and Avigation Easement and Non-Suit Covenant in the title search prior to the purchase of a property. A study by the Department showed that there has been no adverse impact on the value or marketability of these properties.

## Wisconsin Statutes on Land Use Control Authority For Airport Owning Jurisdictions

| Action   | City         | County  | Town    | Village |
|--|--------------|---------|---------|---------|
| <b>Acquire Property &amp; Property Rights (easement)</b> | 62.22        | 59.58   | 67.04   | 61.34   |
|  | 67.04        | 67.04   | 114.11  | 67.04   |
|  | 114.11       | 114.11  | 114.12  | 114.11  |
|  | 114.12       | 114.12  | 114.13  | 114.12  |
|  | 114.13       | 114.13  | 114.135 | 114.13  |
|  | 114.135      | 114.135 |         | 114.135 |
| <b>Land Use Zoning</b>                                   | 62.23(6)&(7) | 59.69   | 60.61   | 61.35   |
|  | 66.1009      | 66.31   | 66.31   | 66.31   |
|  | 114.136      | 114.136 | 114.136 | 114.136 |
| <b>Height Limitation Zoning</b>                          | 114.136      | 114.136 | 114.136 | 114.136 |
| <b>Plat Approval</b>                                     | 236.10       | 236.10  | 236.10  | 236.10  |
|  | 236.12       |         |         |         |
| <b>Subdivision Review</b>                                | 236.45       | 236.45  | 236.45  | 236.45  |

## **Building Codes**

Building codes establish noise performance requirements typically associated with the building envelope, including minimum sound transmission requirements. Once aircraft noise impact areas are defined, municipal building codes should be amended to require soundproofing of new structures built in these areas. Permissible interior sound levels, based on acceptable levels, should be the same for all similarly used structures in the community. Soundproofing could also be a requirement for a conditional use permit in a zone where the intended use would ordinarily not be allowed.

## **Community Improvements**

Land use regulations help implement plans by enforcing plan policies and insuring compliance with plan design elements. Other official actions to implement plans also affect the use of land around airports. The extension of utilities and streets, and locating schools and parks are decisions that are instrumental to community development. Each of these decisions can be critical to the integrity of a land use plan that preserves airport-compatible uses.

Utilities, especially water and sewers, are necessary for intensive residential development. Decisions on when and where to extend these utilities should be guided by the community land use plan. The extension of utilities according to a plan prevents the inefficient use of community finances and facilities, as well as deterring incompatible land use.

The extension of streets, and especially high capacity routes, may open areas of the community to new residential development. While access to airports and airport-associated uses should be a consideration in planning highway access, highways may induce development incompatible with airports. These relationships should be an important consideration in community planning. Land use and highway plans should be consistent in their design objectives.

District school boards should be aware of the plans for community growth including the location of desired future residential areas. The location of school sites ahead of development helps implement the community plan and save the school district's money. Schools affected by aircraft noise or in approach zones should be phased out of use and new schools should not be built in these areas.

The location of parks and the phasing of their development are actions affecting all parts of the land use plan. Parks, like streets, can be located on an official map that reserves the indicated areas for official use. The community must then purchase these future parklands within a reasonable period of time. Parks can also benefit the community when they provide airport protection. Though most park uses are suitable for approach zones, aircraft operations should be a consideration in the park design.

Also, be aware when planning for airports that Federal Law (Section 4(f) of the DOT Act) (<http://www.uscg.mil/systems/gse/determin.htm>) prohibits the use of any publicly owned land from a public park, recreation area, wildlife/waterfowl refuge, or historic site of national, state or local significance unless there is no feasible and prudent alternative to the use of the land. In other words, it would be extremely difficult to justify purchasing parklands for airport development using federal, state, or local funds.

## **Section Five: Examples of Airport Land Use Planning**

The compatible land use planning requirements for each airport in the state is unique. Consequently, communities throughout Wisconsin have used a variety of methods for protecting their airports from encroachment by incompatible land uses.

This final section reviews the experiences of some Wisconsin communities in airport planning. It also provides an inventory of airports included in the SASP that have adopted airport layout plans, height limitation zoning ordinances, land use zoning ordinances, or master plans.

### **The Austin Straubel Airport Zoning Ordinance**

When Brown County's Austin Straubel Field opened in 1947, most residents of the Green Bay area never realized that the agricultural land and woodlands surrounding the airport would some day be filled with businesses and residential development. The growth of the Green Bay metropolitan area brought dense urban development in the three miles surrounding the around the airport.

In 1986, Wisconsin State Statute 114.136 was used to adopt an airport zoning ordinance and a district plan was established which provided for three district zones in the airport vicinity.

District A is known as the Noise Cone/Crash Hazard Zone. It extends outward from the end of the major runways and includes all areas where the 65Ldn noise cone and the crash

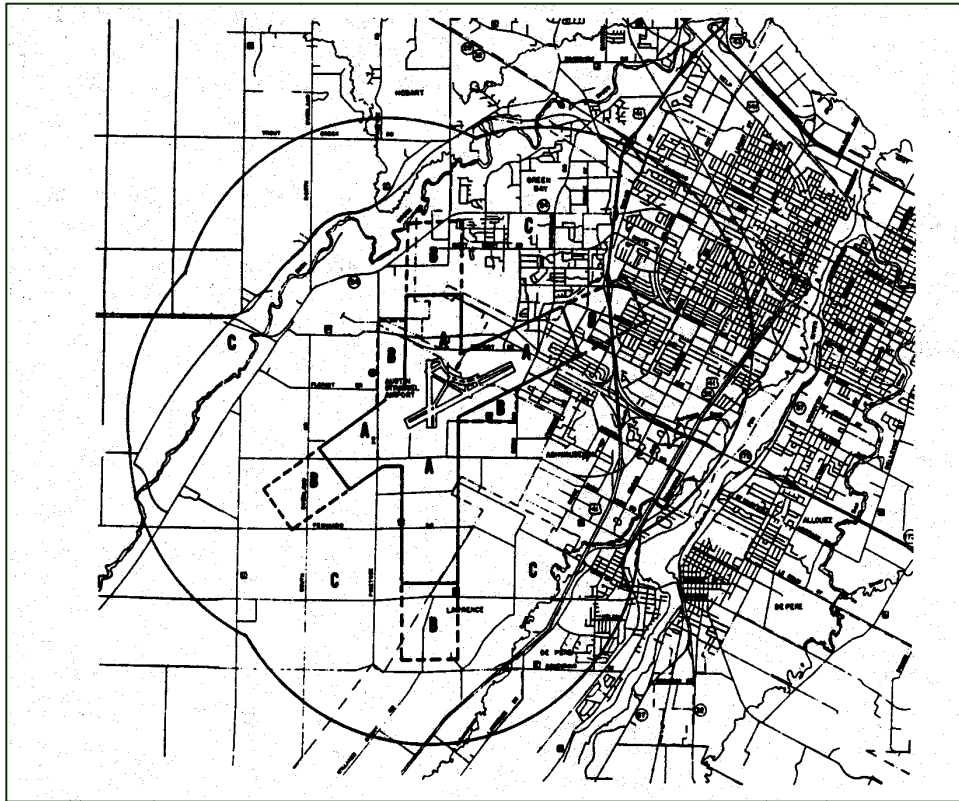
hazard areas coincide. This zone reflects the most critical approaches to the airport and, therefore, has the greatest need of protection from incompatible land use. All types of new residential development are prohibited in this district. New development is limited to farm-related housing along with commercial and industrial uses. All new buildings must be soundproofed to provide a noise level reduction (NLR) 20 decibels in excess of current building industry standards.

District B is known as the Overflight/Noise Zone and extends outward approximately one mile from District A. It encompasses areas that are still subject to the noise of aircraft takeoffs and landings, but the noise level is below 65Ldn. It also represents an extension of the critical approaches to the airport and the crash hazard zone. There are some restrictions for new residential, commercial, and industrial development to limit concentrations of people. Also, new construction requires a 5 decibel NLR.

The third district, District C, includes the remaining land area within 3 miles of the airport. In this Height/Noise Zone, building permit applicants are advised of airport proximity and that they may be subject to moderate noise and frequent aircraft overflights. All uses permitted by the affected community's zoning ordinance are permitted in this district. The only extra requirement is compliance with the existing airport height limitation zoning ordinance.

As a result of this effort, the ordinance has proven to be an effective means for the community to promote compatible land uses around the airport.

Figure 13: Austin Straubel Airport Zoning Districts



### **Additional Airports Use of Airport Planning Initiatives**

The City of Kenosha also feared encroachment of the land located around the Kenosha Regional Airport. In 1994, again through the use of State Statute 114.136, the city adopted an airport zoning ordinance which placed various permanent height and use restrictions on land up to three miles from the airport, including land outside of the city's boundaries. The ordinance helps to protect the community by minimizing obstructions and noise levels in the airport vicinity. Though contested in the Wisconsin Courts, the ordinance has been upheld.

The Outagamie County Airport was moved to its present site in 1965 after the original site was closed because of its location relative to residential growth. In 1981, the County Board adopted an airport zoning ordinance (see State Stat. 114.136) which includes four zoned districts that control land use around the airport. In 1998 the ordinance was contested in court. A developer purchased land for the

purpose of building duplexes in a portion of the airport overlay area where residential properties had to occupy at least 1 acre per family unit. The developer sued and asked the court to declare the ordinance invalid and unenforceable. The trial court agreed. Ultimately, however, the Court of Appeals in Wisconsin reversed the decision of the trial court and the ordinance was successfully upheld.

The Taylor County Airport experienced residential encroachment located near the approach to its primary runway. In 1998, a zoning ordinance was adopted which established three zoned districts within the three miles around the airport. The ordinance regulates the use of property and restricts the height of structures and objects of natural growth in the vicinity of the airport, thereby increasing safety in the use of the airport and protecting people and property within the airport affected area and zoning districts.

Winnebago County and the City of Oshkosh also were committed to protecting the

investment of their county airport, Wittman Regional Airport. An airport zoning ordinance was adopted in 1976 and amended in 1999 that

includes overlay zones, aviation easements in specific zones and lot division reviews.

**Table 3: Airport Land Use & Noise Compatibility by Airport as of December 2000**

| Associated City   | Airport Name                  | FAA Approved Airport Layout Plan | Height Limitation Zoning Ordinance | Land Use Zoning Ordinance |
|-------------------|-------------------------------|----------------------------------|------------------------------------|---------------------------|
| Amery             | Amery Municipal               | X                                | X                                  |                           |
| Antigo            | Langlade County               | X                                | X                                  |                           |
| Appleton          | Outagamie County              | X                                | X                                  | X                         |
| Ashland           | John F. Kennedy Memorial      | X                                | X                                  |                           |
| Baraboo           | Baraboo-Wisconsin Dells       | X                                | X                                  |                           |
| Barron            | Barron Municipal              |                                  |                                    |                           |
| Black River Falls | Black River Falls Area        | X                                | X                                  |                           |
| Boscobel          | Boscobel                      | X                                |                                    |                           |
| Boulder Junction  | Boulder Junction              |                                  |                                    |                           |
| Boyceville        | Boyceville Municipal          | X                                | X                                  |                           |
| Brookfield        | Capitol Drive                 |                                  |                                    |                           |
| Burlington        | Burlington Municipal          | X                                | X                                  |                           |
| Cable             | Cable Union                   | X                                | X                                  |                           |
| Cassville         | Cassville Municipal           |                                  |                                    |                           |
| Chetek            | Chetek Municipal-Southworth   | X                                | X                                  |                           |
| Clintonville      | Clintonville Municipal        | X                                | X                                  |                           |
| Cornell           | Cornell Municipal             |                                  |                                    |                           |
| Cottage Grove     | Blackhawk Airfield            |                                  |                                    |                           |
| Crandon           | Crandon Municipal             | X                                | X                                  |                           |
| Crivitz           | Crivitz Municipal             | X                                |                                    |                           |
| Cumberland        | Cumberland Municipal          |                                  | X                                  |                           |
| Eagle River       | Eagle River Union             | X                                | X                                  |                           |
| East Troy         | East Troy Municipal           | X                                | X                                  |                           |
| Eau Claire        | Chippewa Valley Regional      | X                                | X                                  |                           |
| Ephraim           | Ephraim-Fish Creek            | X                                | X                                  |                           |
| Fond du Lac       | Fond du Lac County            | X                                | X                                  |                           |
| Fort Atkinson     | Fort Atkinson Municipal       | X                                | X                                  |                           |
| Friendship        | Adams County Legion Field     | X                                | X                                  |                           |
| Grantsburg        | Grantsburg Municipal          |                                  |                                    |                           |
| Green Bay         | Austin Straubel International | X                                | X                                  | X                         |
| Hartford          | Hartford Municipal            | X                                | X                                  |                           |
| Hayward           | Sawyer County                 | X                                | X                                  |                           |
| Hillsboro         | Joshua Sanford Field          |                                  |                                    |                           |
| Janesville        | Rock County                   | X                                | X                                  |                           |
| Juneau            | Dodge County                  | X                                | X                                  |                           |
| Kenosha           | Kenosha Regional              | X                                | X                                  | X                         |
| La Crosse         | La Crosse Municipal           | X                                | X                                  |                           |
| La Pointe         | Madeline Island               | X                                | X                                  |                           |
| Ladysmith         | Rusk County                   | X                                | X                                  |                           |
| Lancaster         | Lancaster Municipal           |                                  |                                    |                           |
| Land O' Lakes     | King's Land O' Lakes          | X                                | X                                  |                           |
| Lone Rock         | Tri-County Regional           | X                                | X                                  |                           |

| Associated City   | Airport Name                    | FAA Approved<br>Airport Layout<br>Plan | Height Limitation<br>Zoning Ordinance | Land Use<br>Zoning<br>Ordinance |
|-------------------|---------------------------------|--|---------------------------------------|---------------------------------|
| Madison           | Dane County Regional            | X                                      | X                                     |                                 |
| Manitowish Waters | Manitowish Waters               | X                                      | X                                     |                                 |
| Manitowoc         | Manitowoc County                | X                                      | X                                     |                                 |
| Marshfield        | Marshfield Municipal            | X                                      | X                                     |                                 |
| Medford           | Taylor County                   | X                                      | X                                     | X                               |
| Menomonie         | Score Field                     | X                                      | X                                     |                                 |
| Merrill           | Merrill Municipal               | X                                      | X                                     |                                 |
| Middleton         | Morey                           | X                                      |                                       |                                 |
| Milwaukee         | General Mitchell International  | X                                      | X                                     |                                 |
| Milwaukee         | Lawrence J. Timmerman           | X                                      | X                                     |                                 |
| Mineral Point     | Iowa County                     | X                                      | X                                     |                                 |
| Minocqua          | Lakeland/Noble F. Lee Memorial  | X                                      | X                                     |                                 |
| Monroe            | Monroe Municipal                | X                                      | X                                     |                                 |
| Mosinee           | Central Wisconsin               | X                                      | X                                     |                                 |
| Necedah           | Necedah                         |  | X                                     |                                 |
| Neillsville       | Neillsville Municipal           | X                                      | X                                     |                                 |
| New Holstein      | New Holstein Municipal          | X                                      | X                                     |                                 |
| New Lisbon        | Mauston-New Lisbon Union        | X                                      | X                                     |                                 |
| New Richmond      | New Richmond Municipal          | X                                      | X                                     |                                 |
| Oconto            | Oconto Municipal                | X                                      | X                                     |                                 |
| Osceola           | L. O. Simenstad Municipal       | X                                      | X                                     |                                 |
| Oshkosh           | Wittman Regional                | X                                      | X                                     | X                               |
| Palmyra           | Palmyra Municipal               |  |                                       |                                 |
| Park Falls        | Park Falls Municipal            | X                                      | X                                     |                                 |
| Phillips          | Price County                    | X                                      | X                                     |                                 |
| Platteville       | Platteville Municipal           | X                                      | X                                     |                                 |
| Portage           | Portage Municipal               |  |                                       |                                 |
| Prairie du Chien  | Prairie du Chien Municipal      | X                                      | X                                     |                                 |
| Prairie du Sac    | Sauk Prairie                    |  |                                       |                                 |
| Prentice          | Prentice                        | X                                      |                                       |                                 |
| Racine            | John H. Batten                  | X                                      | X                                     |                                 |
| Reedsburg         | Reedsburg Municipal             | X                                      | X                                     |                                 |
| Rhineland         | Rhineland-Oneida County         | X                                      | X                                     |                                 |
| Rice Lake         | Rice Lake Regional-Carl's Field | X                                      | X                                     |                                 |
| Richland Center   | Richland                        | X                                      |                                       |                                 |
| Shawano           | Shawano Municipal               | X                                      | X                                     |                                 |
| Sheboygan         | Sheboygan County Memorial       | X                                      | X                                     |                                 |
| Shell Lake        | Shell Lake Municipal            | X                                      |                                       |                                 |
| Siren             | Burnett County                  | X                                      | X                                     |                                 |
| Solon Springs     | Solon Springs Municipal         |  | X                                     |                                 |
| Sparta            | Sparta/Fort McCoy               |  | X                                     |                                 |
| Stevens Point     | Stevens Point Municipal         | X                                      | X                                     |                                 |
| Sturgeon Bay      | Door County -Cherryland         | X                                      | X                                     |                                 |
| Sturtevant        | Sylvania                        |  |                                       |                                 |
| Superior          | Richard I. Bong                 | X                                      | X                                     |                                 |
| Three Lakes       | Three Lakes Municipal           | X                                      |                                       |                                 |
| Tomah             | Bloyer Field                    |  | X                                     |                                 |

| <b>Associated City</b> | <b>Airport Name</b> | <b>FAA Approved<br/>Airport Layout<br/>Plan</b> | <b>Height Limitation<br/>Zoning Ordinance</b> | <b>Land Use<br/>Zoning<br/>Ordinance</b> |
|------------------------|---------------------|---|---|--|
| Tomahawk               | Tomahawk Regional   | X   | X   |  |
| Viroqua                | Viroqua Municipal   | X   | X   |  |
| Washington Island      | Washington Island   | X   | X   |  |
| Watertown              | Watertown Municipal | X   | X   |  |
| Waukesha               | Waukesha County     | X   | X   |  |
| Waupaca                | Waupaca Municipal   | X   | X   |  |
| Wausau                 | Wausau Municipal    | X   | X   |  |
| Wautoma                | Wautoma Municipal   | X   | X   |  |
| West Bend              | West Bend Municipal | X   | X   |  |
| Wild Rose              | Wild Rose Idlewild  |   |   |  |
| Wisconsin Rapids       | Alexander Field     | X   | X   |  |

Source: Wisconsin Department of Transportation, Bureau of Aeronautics

## Conclusion

Because of the extensive land area affected by the location of an airport, no single policy or regulation will ensure that adjacent land uses will be compatible with the airport. The variety of regulations and other governmental actions discussed in this section are presented with the hope that some will be useful in implementing airport land use plans.

The importance of a plan cannot be overstated. Though many of these actions can be taken without the guidance of a plan their effectiveness, both strategically and legally, will be limited.

Airports serve not only urban areas, but the agricultural and recreational areas in their vicinity. Public airport owners should make all

other jurisdictions aware of the benefits they gain from the availability of the airport. If the airport affects several jurisdictions the cooperation of all the jurisdictions is necessary. Each jurisdiction must take action appropriate to the local situation to ensure land use compatibility.

The land use planning requirements for each airport is different as are the possibilities for implementing a plan. Therefore, no standard formula or model ordinance can be suggested that would be suitable for even the majority of airports in Wisconsin. The information presented in this Guide is meant to identify the issue, suggest ways to study the effects of airports on land use, discuss a range of actions to promote land use compatibility, and indicate sources of technical assistance. Plan design and action must be taken by local jurisdictions.

# Appendix A: Measuring Aircraft Noise

## Basic Noise Measures

There are several attributes associated with sound: it may be loud or faint; it may be high-pitched or low, discordant or pleasing, etc. These various characteristics must be quantified in order to arrive at an engineering description of any given sound and to have a means for comparing two sounds separated in space and time.

The word noise is in wide use in many fields of technology today, but if we limit our discussion to its use in relation to sound, one may define noise loosely as unwanted sound. For our purposes an acceptable definition of sound is that it is a physical disturbance of the atmosphere that can be detected by the human ear. A simple source of sound familiar to all of us is the tuning fork. When it is struck, it vibrates in a to-and-fro motion setting the air in motion in the same manner. The resulting disturbance of the air travels outward from the tuning fork and upon entering the ear canal of the listener produces an auditory sensation, or sound.

We are concerned in defining the impact of aircraft noise on people, on communities and on land uses. Before discussing these aspects, it is useful to discuss some of the properties of sound and develop some of the quantitative scales that are used in the measurement of sound.

## Decibel Scale

The pressure fluctuations in the quiescent atmosphere, which are detected as sound, are generally very small, but nonetheless there is a large difference in pressure between the faintest audible sound (e.g., rustling leaves) and the loudest sounds (jet engines, rockets). The ratio is on the order of a million billion. Although the human ear can distinguish the difference in loudness between these different sources, the differences in perceived loudness are much smaller than in the actual measured differences in pressure.

It is possible to construct a scale for measuring the pressure fluctuations (sound pressure), which corresponds fairly well with the properties of the human ear as far as loudness perception is concerned. This scale is called the “decibel scale” and quantity that it measures is called sound pressure level. The zero on this scale corresponds roughly to the quietest sound an average person can hear. A sound level of 120 on this scale corresponds to the point where the noise becomes painful.

## Frequency Spectrum

Apart from the loudness of a sound there is the characteristic of pitch. While the size of pressure fluctuations in the air determine the loudness of the sound, the pitch is related to how often such fluctuations repeat. For audible sounds this repetition may vary from about 20 times per second to around 16,000 times per second. If a given sound consists of fluctuations that repeat 440 times per second we say that the sound has a frequency of 440 Hertz (Hz), where one hertz is equivalent to one frequency per second.

There are various kinds of sounds. The sound produced by the simple tuning fork is known as a pure tone and is usually composed of a single frequency. An example of a more complex sound is a musical note such as Middle C on the piano. This kind of sound has a fundamental frequency

(256Hz) plus several overtones or harmonics. In practice one encounters sounds that are much more complex, such as speech, music, and the wide range of sounds classified as noise. Each of these sounds contains energy extending over a rather wide frequency range. This includes, of course, most aircraft noise, as well as the noise produced by most motor vehicles. One can identify the pure tone with the whine of a jet engine compressor or fan, and the broadband noise with the roar of the exhaust of a turbojet engine.

### **A-Weighted Sound Level**

To complicate matters, the human ear is more sensitive to sound energy at higher frequencies than at lower frequencies, and further, the ear's sensitivity to sounds of different frequencies changes with the level (loudness) of the sound. In problems involving people's reaction to noise, one needs a way of accounting for the ears varying sensitivity to noises that vary in frequency and in level. Much effort has gone into studies to develop improved methods of relating physical measurements to the subjective response of human listeners.

One early approach for improving the correlation between measured pressures and subjective human response was the introduction of frequency weighting networks on sound level meters.

The weighting network that is in the widest use today is the A-weighting network. The network discriminates against the lower frequencies, to which the ear is less sensitive, according to a relationship approximating a person's subjective reaction in terms of loudness at moderate sound levels. Noise levels with the A-weighting network are identified as the "A-weighted sound pressure level of 77decibels," or more simply as the "A level of 77dB," or shorter yet, as 77dBA." The A-weighting is widely used throughout the world to measure community and industrial noise. It is also widely used to measure motor vehicle and traffic noise. Table A-1 on the preceding page lists the approximate A-level of some common sounds

### **Day-Night Average Sound Level (DNL)**

The Day-Night average sound level, abbreviated as DNL and symbolized as Ldn, is the 24-hour sound level, in decibels, for the period from midnight to midnight, obtained after the addition of 10 decibels to sound levels from 10 p.m. to 7 a.m. DNL was developed in 1973-74 for the Environmental Protection Agency. DNL is a measurable quantity and can be measured directly at a specific location using portable monitoring equipment. It is widely used for estimating noise impacts at both civil and military airports. DNL may be used for quantifying other noise sources, such as auto traffic, and for comparing them to airport generated noise. A noise contour is a continuous line on a map of the airport vicinity that connects all the points of the same noise exposure level. Contour values usually range from less than 55Ldn for lightly impacted areas to more than 75Ldn for heavily impacted areas. The contours are then drafted on a map of the airport its environs.

## Appendix B: Land Use Compatibility Guidelines

In recent years, aircraft noise has become an important factor in the community planning process. Some significant advances have been made in the reduction of noise at its source. However, noise cannot be eliminated completely. The purpose of considering aircraft noise in the land use planning process is not to prevent development around an airport but rather to encourage development that is compatible with various noise levels. The objective is to guide noise sensitive land uses where there is noise. Where this is not possible, measures should be included in development projects to reduce the effects of the noise.

The following table describes compatible land use information for several land uses as a function of Yearly Day Night Average Sound values (YDNL). The ranges of YDNL values in this table reflect the statistical variability for the responses of large groups of people to noise. Any particular level might not, therefore accurately assess an individual's perception of an actual noise environment. Compatible or non-compatible land use is determined by comparing the predicted or measured YDNL values at a site with the values given. Adjustments or modifications of the descriptions of the land-use categories may be desirable after consideration of specific local conditions.

Compatible designations in this table generally refer to the major use of the site. If other uses with greater sensitivity to noise are permitted by local government at a site, a determination of compatibility must be based on that use which is most adversely affected by noise. When appropriate, noise level reduction through incorporation of sound attenuation into the design and construction of a structure may be necessary to achieve compatibility.

### Land Use Compatibility With Yearly Day-Night Average Sound Levels

|  | <b>Below 65</b> | <b>65-70</b> | <b>70-75</b> | <b>75-80</b> | <b>80-85</b> | <b>Over 85</b> |
|--|-----------------|--------------|--------------|--------------|--------------|----------------|
| <b>RESIDENTIAL</b>   |                 |              |              |              |              |                |
| Residential, other than mobile homes and transient lodging         | Y               | N(1)         | N(1)         | N            | N            | N              |
| Mobile home parks  | Y               | N            | N            | N            | N            | N              |
| Transient lodgings   | Y               | N(1)         | N(1)         | N(1)         | N            | N              |
| <b>PUBLIC USE</b>  |                 |              |              |              |              |                |
| Schools  | Y               | N(1)         | N(1)         | N            | N            | N              |
| Hospitals and nursing homes  | Y               | 25           | 30           | N            | N            | N              |
| Churches, auditoriums, & concert halls                             | Y               | 25           | 30           | N            | N            | N              |
| Government services  | Y               | Y            | 25           | 30           | N            | N              |
| Transportation   | Y               | Y            | Y(2)         | Y(3)         | Y(4)         | Y(4)           |
| Parking  | Y               | Y            | Y(2)         | Y(3)         | Y(4)         | N              |
| <b>COMMERCIAL USE</b>  |                 |              |              |              |              |                |
| Offices, business and professional                                 | Y               | Y            | 25           | 30           | N            | N              |
| Wholesale & retail—building materials, hardware and farm equipment | Y               | Y            | Y(2)         | Y(3)         | Y(4)         | N              |
| Retail trade—general   | Y               | Y            | 25           | 30           | N            | N              |
| Utilities  | Y               | Y            | Y(2)         | Y(3)         | Y(4)         | N              |
| Communication  | Y               | Y            | 25           | 30           | N            | N              |
| <b>MANUFACTURING &amp; PRODUCTION</b>                              |                 |              |              |              |              |                |
| Manufacturing, general   | Y               | Y            | Y(2)         | Y(3)         | Y(4)         | N              |
| Photographic and optical   | Y               | Y            | 25           | 30           | N            | N              |
| Agriculture (except livestock) and forestry                        | Y               | Y(6)         | Y(7)         | Y(8)         | Y(8)         | Y(8)           |
| Livestock farming and breeding                                     | Y               | Y(6)         | Y(7)         | N            | N            | N              |

|  | <b>Below<br/>65</b> | <b>65-70</b> | <b>70-75</b> | <b>75-80</b> | <b>80-85</b> | <b>Over 85</b> |
|--|---------------------|--------------|--------------|--------------|--------------|----------------|
| Mining and fishing, resource production and extraction | Y                   | Y            | Y            | Y            | Y            | Y              |
| <b>RECREATIONAL</b>                                    |                     |              |              |              |              |                |
| Outdoor sports arenas and spectator sports             | Y                   | Y(5)         | Y(5)         | N            | N            | N              |
| Outdoor music shells, amphitheaters                    | Y                   | N            | N            | N            | N            | N              |
| Nature exhibits and zoos                               | Y                   | Y            | N            | N            | N            | N              |
| Amusements, parks, resorts, and camps                  | Y                   | Y            | Y            | N            | N            | N              |
| riding stables and water recreation                    | Y                   | Y            | 25           | 30           | N            | N              |

Source: U.S. DOT/FAA/FAR Part 150  
Numbers in parenthesis refer to notes.

\*The designations contained in this table do not constitute a Federal determination that any use of land covered by the program is acceptable or unacceptable under Federal, State, or local law. The responsibility for determining the acceptable and permissible land uses and the relationship between specific properties and specific noise contours rests with the local authorities. FAA determinations under Part 150 are not intended to substitute federally determined land uses for those determined to be appropriate by local authorities in response to locally determined needs and values in achieving noise compatible land uses.

#### **Key to Table**

SLUCM = Standard Land Use Coding Manual.

Y(YES)=Land Use and related structures compatible without restrictions.

N(NO)=Land Use and related structures are not compatible and should be prohibited

NLR=Noise Level Reduction (outdoor to indoor) to be achieved through incorporation of noise attenuation into the design and construction of the structure.

25, 30, or 35 = Land use and related structures generally compatible; measures to achieve NLR of 25, 30, or 35 dB must be incorporated into design and construction of structure.

#### **Notes For Table**

- (1) Where the community determines that residential or school uses must be allowed, measures to achieve outdoor to indoor Noise Level Reduction (NLR) of at least 25 dB and 30 dB should be incorporated into building codes and be considered in individual approvals. Normal residential construction can be expected to provide a NLR of 20 dB, thus, the reduction requirements are often stated as 5, 10, or 15 dB over standard construction and normally assume mechanical ventilation and closed windows year round. However, the use of NLR criteria will not eliminate outdoor noise problems.
- (2) Measures to achieve NLR of 25 dB must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise sensitive areas or where the normal noise level is low.
- (3) Measures to achieve NLR of 30 dB must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise sensitive areas or where the normal noise level is low.
- (4) Measures to achieve NLR of 35 dB must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise sensitive areas or where the normal noise level is low.
- (5) Land use compatible provided special sound reinforcement systems are installed.
- (6) Residential buildings require an NLR of 25.
- (7) Residential buildings require an NLR of 30.
- (8) Residential buildings are not permitted.

## Appendix C – Example -Noise & Avigation Easement & Non-Suit Covenant

This indenture made this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_, by and between \_\_\_\_\_, hereinafter referred to as Grantor, and Dane County, a municipal corporation organized and existing under the laws of the State of Wisconsin, hereinafter referred to as Grantee, witnesseth:

WHEREAS the Grantor is the owner in fee of a certain parcel of land in the County of Dane, State of Wisconsin; and

WHEREAS said parcel of land is near Dane County Regional Airport, is within an Airport Noise Overlay Zone as defined by the Zoning Ordinance of the County of Dane, and is subject to existing or forecast aircraft noise levels in excess of 65 Ldn; and

WHEREAS the Grantee is the owner and operator of the Dane County Regional Airport; and

WHEREAS the Grantor proposes to make a use of said land and to develop thereon the following:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

which use and development require approval by Municipal and County authorities subject to the applicable provisions of law; and

WHEREAS the Grantor has been advised that the subject property is located in a noise-impacted area; that these present and future noise impacts might be annoying to users of the land for its stated purpose and might interfere with the unrestricted use and enjoyment of the property in its intended use; that these noise impacts might change over time by virtue of greater numbers of aircraft, louder aircraft, seasonal variations, and time-of-day variations; that changes in airport, air traffic control operating procedures or in airport layout could result in increased noise impact; and that the grantor's and users' own personal perceptions of the noise exposure could change and that his or her sensitivity to aircraft noise could increase;

NOW, THEREFORE, for and in consideration of the mutual covenants, agreements and conditions contained herein, the parties hereto agree as follows:

Grantor does hereby grant a permanent noise and avigation easement to Grantee overall of the following described real estate:

Provided, however, that the airspace in which the said easement and right-of-way is herein granted shall be that airspace which lies at or above \_\_\_\_\_ feet above mean sea level (MSL) which is \_\_\_\_\_ feet above the present surface level of the land, which land is \_\_\_\_\_ feet above MSL. Determination of non-conforming obstructions shall be based on the height of the obstruction above meal sea level (MSL).

Grantor does hereby grant and convey to the Grantee, its successors and assigns, a continuing right to keep the airspace above the aforesaid heights clear and free from any and all fences, crops, trees, poles, buildings, and other obstructions of any kind or nature whatsoever which now extend, or which may at any time in the future extend, above the aforesaid heights of land, together with the right of ingress to, egress from, and passage over the land of the Grantor first above described for the purpose of effecting and maintaining such clearances and of removing any and all obstructions which now or may hereafter extend above the said heights. All rights hereby granted are limited to the exercise of such rights at or above the Mean Sea Level height limitations over the Grantor's land herein specified, and their effect on the parcel of land herein described.

Grantor herby covenants, both for himself and his heirs, executors, administrators and assigns, for and during the life of this easement as follows:

- (a) Grantor shall not hereafter construct nor permit any obstruction upon said land that extends above the heights aforesaid, and

- (b) Grantor shall not hereafter use or permit the use of the land first above described in such a manner as to create electrical interference with radio communication between the airport and aircraft or as to make it difficult for flyers to distinguish between airport lights and others, or as to result in glare in the eyes of flyers using the airport, or as to impair visibility in the vicinity of the airport, or as otherwise to endanger the landing, take-off or maneuvering of aircraft.

By virtue of this agreement, the Grantor, for and on behalf of himself and all successors in interest to any and all of the real property above described, waives as to Grantee or any successor agency legally authorized to operate said airport, any and all claims for damage of any kind whatsoever incurred as a result of aircraft using the "easement" granted herein regardless of any future changes in volume or character of aircraft overflights, or changes in airport design and operating policies, or changes in air traffic control procedures.

The Grantor, for and on behalf of himself and all successors in interest to any and all of the real property above described, does further hereby covenant and agree with the Grantee, its successors and assigns, that it will not, from and after the effective date hereof, sue, prosecute, molest, or trouble the Grantee, its successors and assigns, in respect to or on account of the flight of any and all aircraft over or near the said parcel of land, or for any effects resulting there from including but not limited to noise, air pollution, or any and all other possible damages to or taking of said property resulting from such flights.

These covenants and agreements shall run with the land of the Grantor, as hereinabove described, for the benefit of the Grantee, and its successors and assigns in the ownership, use and operation of the aforesaid Airport.

Grantee, its successors and assigns, shall have and hold said easement and all rights appertaining thereto until said airport shall be abandoned and shall cease to be used for airport purposes.

IN WITNESS WHEREOF, the Grantor has hereunto set its hand and seal the day and year first above written.

\_\_\_\_\_(SEAL)

\_\_\_\_\_(SEAL)

## NOTARY ACKNOWLEDGEMENT

STATE OF WISCONSIN

COUNTY OF DANE

Personally, came before me, this \_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_. \_\_\_\_\_ and \_\_\_\_\_ of the above named Corporation, to me known to be the person who executed for foregoing instrument and to me known to be such \_\_\_\_\_ and \_\_\_\_\_ of said Corporation, and acknowledged that they executed the foregoing instrument such officers as the deed of said Corporation, by its authority.

\_\_\_\_\_  
Notary Public, State of Wisconsin

My Commission Expires \_\_\_\_\_

## Suggested Disclosure to Real Estate Buyers

Customarily, someone will request a letter from the municipality about outstanding charges and assessments against a property. Something similar to this language, adapted for your airport, can be incorporated into a letter sent to buyers and title companies in preparation for closing.

“Please be advised that the subject property is located within the height restriction zone of the \_\_\_\_\_ Airport, or is located within a similar distance from the airport. It is conceivable that standard flight patterns would result in aircraft passing over (or nearly so) the property at altitudes of less than \_\_\_\_\_ feet. Current airport use patterns suggest that the average number of takeoffs/touchdowns exceeds \_\_\_\_\_ annually. A property buyer should be aware that use patterns vary greatly, with the possibility of increased traffic on \_\_\_\_\_. The airport presently serves primarily recreational aircraft, and there are no current initiatives to extend any runway beyond the current \_\_\_\_\_ length. Airport plans allow for runway extension in the future, which might impact the number and size of both pleasure and non-pleasure aircraft. Generally, it is not practical to redirect or severely limit airport usage and/or planned-for expansion, and residential development proximate to the airport ought to assume, at some indefinite date, an impact from air traffic.

## References

*A Guide to Wisconsin's Recent Comprehensive Planning Legislation*; Updated Version, Office of Land Information Services; Wisconsin Department of Administration, June 2000

*The Recent Comprehensive Planning Legislation*; Statutory Language Changes from 1999 Wisconsin Act 9 and Technical Revisions from AB872 signed into law by Governor Thompson on May 10, 2000; Office of Land Information Services, Department of Administration, June 2000

*Land Use Compatibility and Airports*, FAA Airports Division, Southern Region, September 1999

*Transportation Planning Resource Guide*; A Guide to Preparing the Transportation Element of a Local Comprehensive Plan; Wisconsin Department of Transportation, December 2000

*Wisconsin State Airport System Plan 2020*, Technical Report

*NBAA Business Aviation Fact Book 2000*